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NOTIFICATION OF AUTOMATICALLY FORWARDED ELECTRONIC MAIL MESSAGES IN A DATA PROCESSING SYSTEM

BACKGROUND OF THE INVENTION

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1. Technical Field:

The present invention relates generally to an improved data processing system, and in particular to a method and apparatus for processing electronic mail
10   messages. Still more particularly, the present invention relates generally to a method and apparatus for processing automatically forwarded electronic mail messages.

15   ### 2. Description of Related Art:

The Internet, also referred to as an "internetwork", is a set of computer networks, possibly dissimilar, joined together by means of gateways that handle data transfer and the conversion of messages from the sending network to
20   the protocols used by the receiving network (with packets if necessary). When capitalized, the term "Internet" refers to the collection of networks and gateways that use the TCP/IP suite of protocols.

The Internet has become a cultural fixture as a
25   source of both information and entertainment. Many businesses are creating Internet sites as an integral part of their marketing efforts, informing consumers of the products or services offered by the business or providing other information seeking to engender brand loyalty. Many
30   federal, state, and local government agencies are also employing Internet sites for informational purposes,

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particularly agencies which must interact with virtually
all segments of society such as the Internal Revenue
Service and secretaries of state. Providing informational
guides and/or searchable databases of online public
5   records may reduce operating costs. Further, the Internet
is becoming increasingly popular as a medium for
commercial transactions.

The Internet also provides a medium for sending
electronic mail messages between different users or
10   recipients. These electronic mail messages are also
referred to as email. With email, a user may send a
message to one or more recipients almost instantaneously.
Some users may have more than one email address.
Additionally, email addresses are constantly changing for
15   different reasons. Sometimes, a user may change service
providers and receive a new email address. Other times, a
service provider may be bought by or merged with another
service provider. Sometimes when a service provider is
bought or merged with another service provider, the
20   combined entity will force or require some users to change
domain names to have a consistent domain name in the email
addresses.

When such a situation occurs, a user changing email
addresses is required to notify everyone of the email
25   address change. In many cases, when a change in domain
name is required by a service provider, a grace period may
be present in which both email addresses are accepted.
When a user changes service providers, the user typically
will maintain the old email address for a period of time
30   and have the email sent to the old address forwarded to
the new address.

It is important for a user to recognize that email is

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being forwarded from the original address to the new
address in order to notify the sender of the email of the
address change.   Currently, this forwarding must be
detected by looking at the "to:" field in the message to
5   determine whether the address is the old address.   In some
cases, the message may be sent to many recipients in which
all of these recipients are listed in the "to:" field.
Such a procedure can become tedious when many recipients
are listed for the email.   Further, even if the user is
10   meticulous in checking every email received to see whether
it was forwarded from an old address, the address may not
appear at all.   For example, some email may be sent via
distribution lists using a remailer program.   In this
case, the sender sends a note addressed to the
15   distribution list on the server and the program
distributes the email to all addresses currently found on
the list.   The "to:" field in the note may show for
example, "distlistmail@abcd.org" rather than all of the
addresses in the list.   The actual address in this case is
20   located in the routing information, but this information
is typically removed by many email programs.

     Therefore, it would be advantageous to have an
improved method and apparatus for processing forwarded
email messages to allow a user to identify messages
25   forwarded from an old email address.

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SUMMARY OF THE INVENTION

The present invention provides a method, system, and
5   program in a data processing system for processing an
electronic mail message. The electronic mail message is
identified for a recipient. It is determined whether the
electronic mail message for the recipient is being
forwarded from another address associated with the
10   recipient. An indicator is included to identify the
electronic mail message as being forwarded if the
electronic mail message being forwarded is from another
address associated with the recipient.

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BRIEF DESCRIPTION OF THE DRAWINGS

5   The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in
10   conjunction with the accompanying drawings, wherein:

Figure 1 depicts a pictorial representation of a distributed data processing system in which the present invention may be implemented;

Figure 2 is a block diagram of a data processing
15   system that may be implemented as a server in accordance with a preferred embodiment of the present invention;

Figure 3 is a block diagram illustrating a data processing system in which the present invention may be implemented;

20   **Figure 4** is a diagram illustrating an indicator for use in an email message in accordance with a preferred embodiment of the present invention;

Figure 5 is a diagram illustrating components and data flow used in indicating forwarding of email messages
25   in accordance with a preferred embodiment of the present invention; and

Figure 6 is a flowchart of a process used for providing indicators for forwarded email messages in accordance with a preferred embodiment of the present
30   invention.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the figures, **Figure 1** depicts a
5   pictorial representation of a data processing system
network in which the present invention may be implemented.
Data processing system network **100** is a network of
computers in which the present invention may be
implemented. Data processing system network **100** contains
10 a network **102**, which is the medium used to provide
communications links between various devices and computers
connected together within data processing system network
100. Network **102** may include permanent connections, such
as wire or fiber optic cables, or temporary connections
15 made through telephone connections.

In the depicted example, a server **104** is connected to
network **102** along with proxy server **106**. In addition,
clients **108, 110,** and **112** also are connected to network
102. These clients **108, 110,** and **112** may be, for example,
20 personal computers or network computers. In the depicted
example, server **104** provides data, such as boot files,
operating system images, and applications to clients
108-112. Server **104** also may serve to receive and
distribute email messages to different clients. In the
25 depicted examples, proxy server **106** also may serve to
distribute email messages to different clients. In this
example, proxy server **106** may receive messages from server
104 for distribution to different clients.

Clients **108, 110,** and **112** are clients to server **104**.
30 Distributed data processing system **100** may include
additional servers, clients, and other devices not shown.

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In the depicted example, data processing system network
100 is the Internet with network **102** representing a
worldwide collection of networks and gateways that use the
TCP/IP suite of protocols to communicate with one another.

5 At the heart of the Internet is a backbone of high-speed
data communication lines between major nodes or host
computers, consisting of thousands of commercial,
government, educational and other computer systems that
route data and messages. Of course, data processing

10 system network **100** also may be implemented as a number of
different types of networks, such as for example, an
intranet, a local area network (LAN), or a wide area
network (WAN). **Figure 1** is intended as an example, and not
as an architectural limitation for the present invention.

15   Referring to **Figure 2,** a block diagram of a data
processing system that may be implemented as a server,
such as server **104** or proxy server **106** in **Figure 1,** is
depicted in accordance with a preferred embodiment of the
present invention. In particular, server **200** contains the

20 processes used to notify users or recipients of email
messages that an email has been forwarded. The
notification mechanism of the present invention includes
an indicator or indication in the email message that the
email message has been forwarded from another address

25 associated with the user or recipient.
    Server **200** may be a symmetric multiprocessor (SMP)
system including a plurality of processors **202** and **204**
connected to system bus **206.** Alternatively, a single
processor system may be employed. Also connected to

30 system bus **206** is memory controller/cache **208,** which
provides an interface to local memory **209.** I/O bus bridge

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210 is connected to system bus **206** and provides an
interface to I/O bus **212**. Memory controller/cache **208** and
I/O bus bridge **210** may be integrated as depicted.

5   Peripheral component interconnect (PCI) bus bridge
214 connected to I/O bus **212** provides an interface to PCI
local bus **216**. A number of modems may be connected to PCI
bus **216**. Typical PCI bus implementations will support
four PCI expansion slots or add-in connectors.
Communications links to network computers **108-112** in
10   **Figure 1** may be provided through modem **218** and network
adapter **220** connected to PCI local bus **216** through add-in
boards.

Additional PCI bus bridges **222** and **224** provide
interfaces for additional PCI buses **226** and **228**, from
15   which additional modems or network adapters may be
supported. In this manner, data processing system **200**
allows connections to multiple network computers. A
memory-mapped graphics adapter **230** and hard disk **232** may
also be connected to I/O bus **212** as depicted, either
20   directly or indirectly.

Those of ordinary skill in the art will appreciate
that the hardware depicted in **Figure 2** may vary. For
example, other peripheral devices, such as optical disk
drives and the like, also may be used in addition to or in
25   place of the hardware depicted. The depicted example is
not meant to imply architectural limitations with respect
to the present invention.

The data processing system depicted in **Figure 2** may
be, for example, an IBM RISC/System 6000 system, a product
30   of International Business Machines Corporation in Armonk,
New York, running the Advanced Interactive Executive (AIX)

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operating system.

    With reference now to **Figure 3,** a block diagram illustrating a data processing system in which the present invention may be implemented is depicted. Data processing

5   system **300** is an example of a client computer. Data processing system **300** employs a peripheral component interconnect (PCI) local bus architecture. Although the depicted example employs a PCI bus, other bus architectures such as Accelerated Graphics Port (AGP) and

10   Industry Standard Architecture (ISA) may be used. Processor **302** and main memory **304** are connected to PCI local bus **306** through PCI bridge **308**. PCI bridge **308** also may include an integrated memory controller and cache memory for processor **302**. Additional connections to PCI

15   local bus **306** may be made through direct component interconnection or through add-in boards. In the depicted example, local area network (LAN) adapter **310**, SCSI host bus adapter **312**, and expansion bus interface **314** are connected to PCI local bus **306** by direct component

20   connection. In contrast, audio adapter **316**, graphics adapter **318**, and audio/video adapter **319** are connected to PCI local bus **306** by add-in boards inserted into expansion slots. Expansion bus interface **314** provides a connection for a keyboard and mouse adapter **320**, modem **322**, and

25   additional memory **324**. Small computer system interface (SCSI) host bus adapter **312** provides a connection for hard disk drive **326**, tape drive **328**, and CD-ROM drive **330**. Typical PCI local bus implementations will support three or four PCI expansion slots or add-in connectors.

30   An operating system runs on processor **302** and is used to coordinate and provide control of various components

within data processing system **300** in **Figure 3**. The
operating system may be a commercially available operating
system, such as Windows 2000, which is available from
Microsoft Corporation. An object oriented programming
5   system such as Java may run in conjunction with the
operating system and provides calls to the operating
system from Java programs or applications executing on
data processing system **300**. "Java" is a trademark of Sun
Microsystems, Inc. Instructions for the operating system,
10   the object-oriented operating system, and applications or
programs are located on storage devices, such as hard disk
drive **326,** and may be loaded into main memory **304** for
execution by processor **302**.

       Those of ordinary skill in the art will appreciate
15   that the hardware in **Figure 3** may vary depending on the
implementation. Other internal hardware or peripheral
devices, such as flash ROM (or equivalent nonvolatile
memory) or optical disk drives and the like, may be used
in addition to or in place of the hardware depicted in
20   **Figure 3**. Also, the processes of the present invention
may be applied to a multiprocessor data processing
system.

       For example, data processing system **300,** if
optionally configured as a network computer, may not
25   include SCSI host bus adapter **312,** hard disk drive **326,**
tape drive **328,** and CD-ROM **330,** as noted by dotted line
332 in **Figure 3** denoting optional inclusion. In that
case, the computer, to be properly called a client
computer, must include some type of network communication
30   interface, such as LAN adapter **310,** modem **322,** or the
like. As another example, data processing system **300** may

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be a stand-alone system configured to be bootable without
relying on some type of network communication interface,
whether or not data processing system **300** comprises some
type of network communication interface. As a further
5   example, data processing system **300** may be a Personal
Digital Assistant (PDA) device, which is configured with
ROM and/or flash ROM in order to provide non-volatile
memory for storing operating system files and/or
user-generated data.

10   The depicted example in **Figure 3** and above-described
examples are not meant to imply architectural
limitations. For example, data processing system **300**
also may be a notebook computer or hand held computer in
addition to taking the form of a PDA. Data processing
15   system **300** also may be a kiosk or a Web appliance.

The present invention provides a method, apparatus,
and program for indicating that an email message has been
forwarded from an email address associated with a
recipient. This associated address is typically an old
20   email address that the recipient intends to no longer use
after a period of time. The mechanism of the present
invention identifies these type of email addresses and
adds or includes an indicator with the email message. In
the depicted example, the indicator takes the form of a
25   block of text added to the body of the email message.

Turning next to **Figure 4**, a diagram illustrating an
indicator for use in an email message is depicted in
accordance with a preferred embodiment of the present
invention. In this example, indicator **400** is a visual
30   indicator that is placed within an email message.
Specifically, indicator **400** is placed in the body portion

of the message. The body portion of an email message is that portion of the email message in which the actual content of the message is placed.

In this example, indicator **400** takes the form of
5 text, identifying the message as being an email message forwarded from a particular address and reminding the recipient to notify the sender of the new address. Further, this text may be placed using different colors than the text of the rest of the message in the email
10 message. Depending on the particular implementation, the indicator may take different forms other than that as illustrated by indicator **400**. For example, a graphical indicator may be used instead of text. The indicator may be another window, such as a browser, which is
15 automatically launched when the email is viewed. Audio indicators may be used in place of or in addition to the visual indicators. An audio indicator may be, for example, a ".wav" file that is played or presented when the email message is viewed.

20 Turning next to **Figure 5,** a diagram illustrating components and data flow used in indicating forwarding of email messages is depicted in accordance with a preferred embodiment of the present invention. In this example, proxy server **500** receives email messages from an email
25 server **502.** These email messages are forwarded to different recipients, such as recipient **504.** Of course, these processes also may be implemented in an email server, such as email server **502,** rather than proxy server **500** used to forward email messages.

30 Email messages are received and placed into incoming email **506** to await processing. Incoming email **506** may

be, for example, a buffer or queue used for holding email messages until they are processed. Email process **508** examines each email message within incoming email **506** to see whether the email is to be forwarded to another

5 address for the recipient. If the email message is to be forwarded to another email address other than the original email address in the email message, a notification will be placed into the email message or associated with the email message from notification

10 database **510**. This notification may take the form of indicator **400** in **Figure 4**. The notification may include, for example, the old email address that the sender used as well as an indication to notify the sender of the new email address. Of course, the indicator selected from

15 notification database **510** may take other forms, such as using graphics or audio presentation.

Further, email process **508** also may place an advertisement into the email message from advertisement database **512**. Also, a user may be billed for the

20 notification service. In such a case, billing database **514** is updated by email process **508** each time a particular user receives a notification of a forwarded email message. Billing database **514** may include an identification of the recipient who is to receive

25 notifications of forwarded email messages and tracking information to identify the number of times that notifications have been placed in an email message.

When the email message has been processed, the message is placed into outgoing email **516** for delivery to

30 a recipient, such as recipient **504**. Like incoming email **506**, outgoing email **516** may be a buffer or queue for

processed email messages in these examples.

Proxy server **500** provides a mechanism for forwarding email messages with indicators. Proxy server **500** further provides a mechanism in which advertisements or billing

5   may occur for email messages being forwarded to a particular recipient. Additionally, existing mail servers are not required to make changes to support this forwarding mechanism in which indicators are added or associated with an email message.

10 Turning next to **Figure 6,** a flowchart of a process used for providing indicators for forwarded email messages is depicted in accordance with a preferred embodiment of the present invention. In these examples, the process illustrated in **Figure 6** may be implemented

15 within an email server such as server **104** or proxy server **106** in **Figure 1.**

The process begins by receiving an email message (step **600**). A recipient is then identified for the email message (step **602**). Next, a determination is made as to

20 whether the email message is a forwarded email message for another address for the recipient (step **604**). If the message is to be forwarded, then a determination is made as to whether the recipient is to receive an indicator notifying the recipient that the email message is a

25 forwarded email message (step **606**).

If the recipient is to receive a notification, an indicator of the forwarding of the message is added to the body of the email message (step **608**). In these examples, the indicator is added to the body of the email

30 message, using an indicator, such as indicator **400** in **Figure 4.** Of course, other types of indicators, such as

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those described above, may be added to the body of the
text or associated with the email message depending on
the implementation.

5   Next, a determination is made as to whether an
advertisement is to be added to the email message (step
610). Depending on the implementation, an advertisement
may be placed in the message as a mechanism to generate
revenues for the function from entities wanting to
distribute advertisements. If an advertisement is to be
10   added, the advertisement is added to the email message
(step 612). Then, a determination is made as to whether
the recipient or some other entity is to be billed for
the addition of the indicator to the email message (step
614). It is also possible that the billing is simply a
15   subscription service, not a per-mail-item charge. The
process proceeds directly to this step from step 610 if
an advertisement is not to be added to the message. The
billing function provides another mechanism to generate
revenues for providing the indicator service for
20   forwarded email messages. If billing is to occur, a
billing database for the recipient or other entity is
then updated to reflect the processing of the email
message (step 616). Thereafter, the email message is
sent to the recipient (step 618) with the process
25   terminating thereafter.

With reference again to step 614, if billing is not
to occur, the process proceeds directly to step 618 as
described above. Referring back to step 606, if the
recipient is not to be notified, then the process
30   proceeds to step 618. Turning back to step 604, if the
email message is not one that is being forwarded from

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another email address associated with the recipient, then
the process proceeds directly to step **618**.

 The process described in **Figure 6** will add the
notification information to the message and remail the
5   message to the forwarding address if the process is
implemented as part of an email server. Alternatively,
if implemented in a proxy server, the email server is
configured to forward all incoming mail to the address
for the proxy server. The proxy server will add the
10   notification prior to forwarding the message to the
recipient. Thus, when implemented with a proxy server,
two "hops" are required to send the message to the
recipient.

 The mechanism of the present invention is
15   particularly useful when an email address for a recipient
is to change. For example, a user has an email address
JerryMalcolm@ibm.net that is going away as a result of a
merger or change in ownership. The host has an email
mailbox server that hosts a mailbox called JerryMalcolm.
20   The owner of that mailbox is able to have the mail server
hold mail for collection by the user's mail program, such
as that provided in Netscape Navigator. Alternatively,
the user may have messages forwarded to a new email
address, such as Jerry@Malcolms.com. If the host mailbox
25   server has implemented the mechanism of the present
invention, the user may have the email server append the
forwarding notification information to the body of the
note as it does the forwarding. If the host email server
does not implement the mechanism of the present
30   invention, but "abc123.com" has a server that does and is
in the business or providing notifications, the user may
contract with abc123.com to provide the user a mailbox on

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their server for a period of time. The user would have
the host email server forward the user's messages to
JerryMalcolm@abc123.com. Subsequently, the user would
have the server for abc123.com forward incoming messages
5   to Jerry@Malcolms.com and also append the forwarding
notification. In turn, abc123.com may either charge the
user for the service, such as in the form of a
subscription or a per-item charge. Alternatively,
abc123.com may obtain revenues for the service by selling
10   advertisement space in the notifications and append
advertisements along with the notifications.

 Thus, the present invention provides an improved
method, apparatus, and program for a forwarding service
or mechanism for forwarding information to an email
15   message. An indicator is added to an email message that
is forwarded from another email address associated with
the recipient. This indicator is used to provide
notification to the recipient that the email message was
sent to another email address and forwarded to the
20   recipient. The indicator is also used to allow the
recipient to notify the sender of the new email address.
In the depicted examples, this function is implemented in
a proxy server, which receives email messages from email
servers. This proxy server identifies whether an email
25   message is being forwarded to another email address for
the user and adds the appropriate indicator.
Additionally, the addition of advertisements and/or
billing may be performed in the proxy server. The use of
the proxy server allows the addition of this forwarding
30   service or function without requiring changes to the
existing email servers.

 It is important to note that while the present

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invention has been described in the context of a fully
functioning data processing system, those of ordinary
skill in the art will appreciate that the processes of
the present invention are capable of being distributed in
5   the form of a computer readable medium of instructions
and a variety of forms and that the present invention
applies equally regardless of the particular type of
signal bearing media actually used to carry out the
distribution. Examples of computer readable media
10 include recordable-type media, such as a floppy disk, a
hard disk drive, a RAM, CD-ROMs, DVD-ROMs, and
transmission-type media, such as digital and analog
communications links, wired or wireless communications
links using transmission forms, such as, for example,
15 radio frequency and light wave transmissions. The
computer readable media may take the form of coded
formats that are decoded for actual use in a particular
data processing system.

The description of the present invention has been
20 presented for purposes of illustration and description,
and is not intended to be exhaustive or limited to the
invention in the form disclosed. Many modifications and
variations will be apparent to those of ordinary skill in
the art. Although the depicted examples illustrated
25 placing the indicator in the body of the electronic
message, the indicator may be placed anywhere within the
electronic message, such as in the subject field. The
embodiment was chosen and described in order to best
explain the principles of the invention, the practical
30 application, and to enable others of ordinary skill in
the art to understand the invention for various
embodiments with various modifications as are suited to

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the particular use contemplated.